Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Mathematics B

Unit 2: Number, Algebra, Geometry 1 (Non-Calculator)

Higher Tier

Mock paper **Time: 1 hour 15 minutes**	Paper Reference **5MB2H/01**

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used**.

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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6/6/3/3/3/3

W 3 9 4 9 2 A 0 1 1 2

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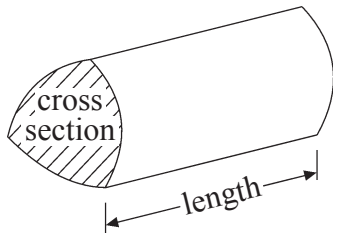
GCSE Mathematics 2MB01

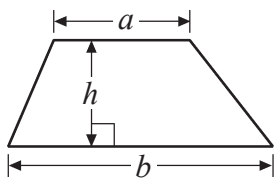
Formulae – Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length

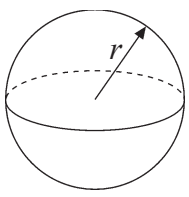


Area of trapezium $= \frac{1}{2}(a+b)h$



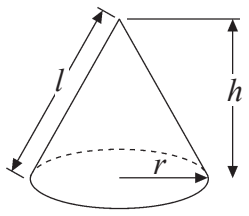
Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$

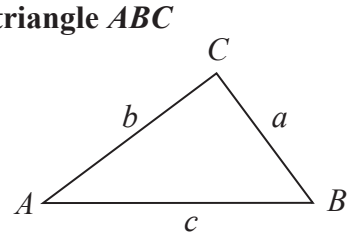


Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



In any triangle *ABC*



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle $= \frac{1}{2}ab\sin C$

W 3 9 4 9 2 A 0 2 1 2

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Using the information that

$$68 \times 39 = 2652$$

write down the value of

(i) 0.68×39

.....

(ii) 6800×3.9

.....

(Total for Question 1 is 2 marks)

2 Here are the first four terms of an arithmetic sequence.

7 10 13 16

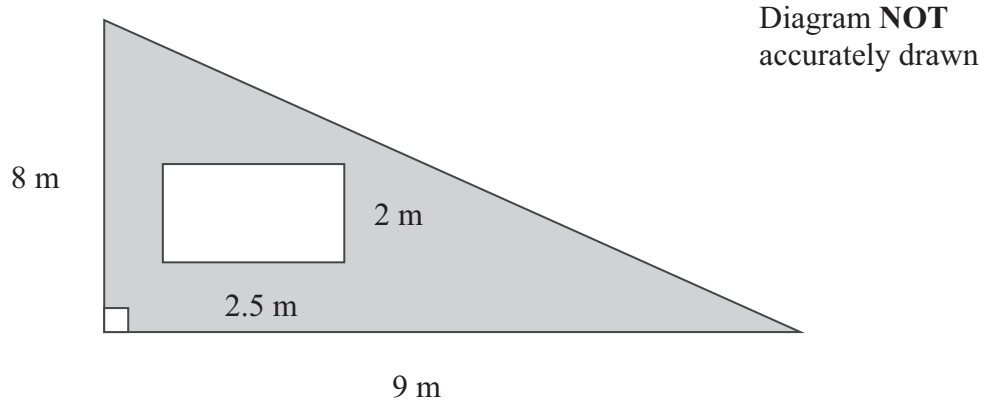
Find, in terms of n, an expression for the nth term of the sequence.

.....

(2)

(Total for Question 2 is 2 marks)

3 The diagram shows a garden with a pond.



The garden is in the shape of a triangle.
The pond is in the shape of a rectangle.

Jim is going to cover the shaded region with gravel.

45 kg of gravel is needed to cover 1 m^2.

How much gravel does Jim need?

..... kg

(Total for Question 3 is 4 marks)

W 3 9 4 9 2 A 0 4 1 2

4 The cash price of a washing machine is £470

Mrs Danvers buys the washing machine.

She pays
a deposit of 30% of the cash price
and £30.25 each month for 12 months.

Mrs Danvers pays, in total, more than £470
How much more?

£ .....

(Total for Question 4 is 4 marks)

5 (a) Expand $4(3m - 2)$

.....

(2)

(b) Factorise $5y^2 + 2y$

.....

(1)

(c) Simplify $x^7 \times x^3$

.....

(1)

(d) Expand and simplify $(t + 8)(t - 5)$

.....

(2)

(Total for Question 5 is 6 marks)

W 3 9 4 9 2 A 0 5 1 2

6 Dan has a solid metal cuboid.

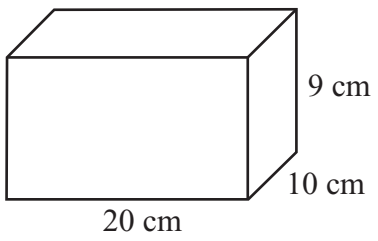


Diagram **NOT** accurately drawn

The cuboid is 20 cm by 10 cm by 9 cm.

Dan heats the cuboid and melts the metal.
He uses the melted metal to make small solid dice.
Each dice is in the shape of a cube of side 2 cm.

Dan uses all of the metal.

How many dice does Dan make?
You must show all your working.

(Total for Question 6 is 4 marks)

7 $v = -4$

$t = 5$

Work out the value of $2v^2 + t^2$

.....

(Total for Question 7 is 2 marks)

8 Milly is making an apple crumble.
For the crumble topping, she uses sugar, butter and flour in the ratio 1 : 2 : 3

Milly uses 500 g of apples for every 300 g of crumble topping.

Milly has 1 kg of apples.
She uses all of the apples.

Work out how much sugar, butter and flour she will need for the crumble topping.

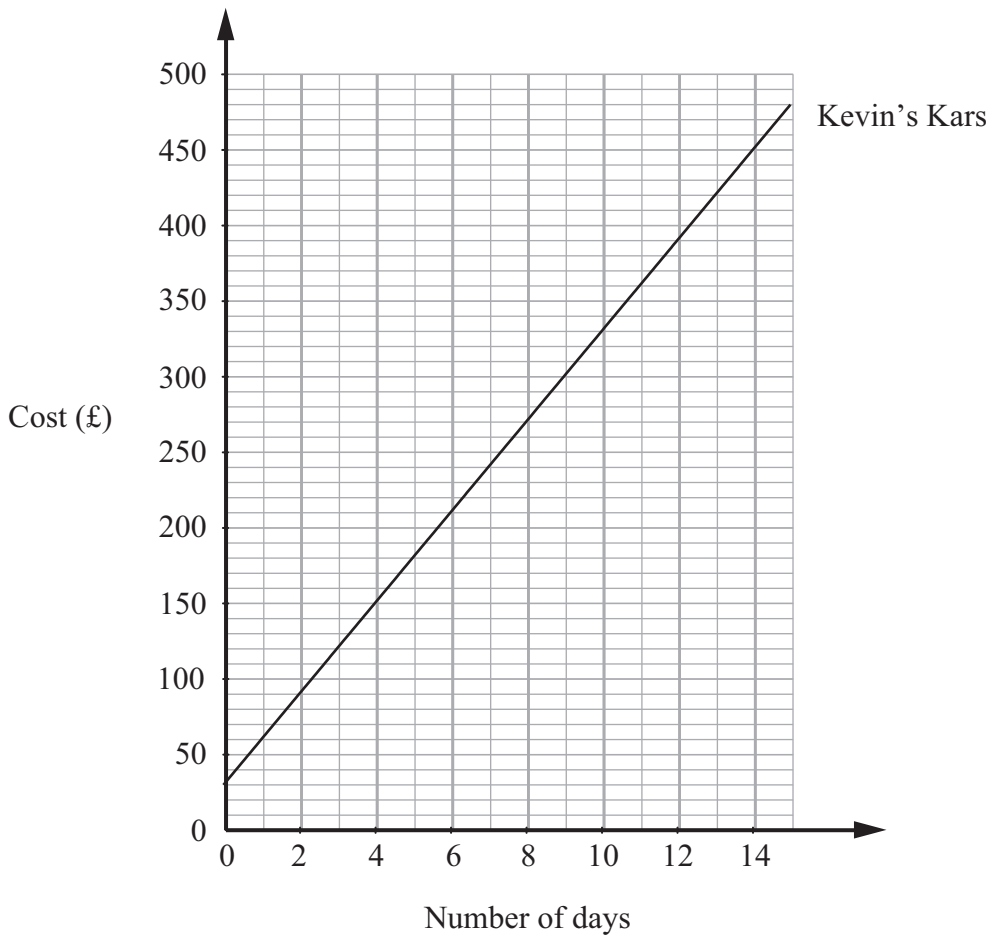
Sugar ..... g

Butter ..... g

Flour ..... g

(Total for Question 8 is 5 marks)

9 Kevin's Kars and Mike's Motors are two car hire companies.
The graph can be used to work out the cost of hiring a car from Kevin's Kars.



Kevin's Kars charges £30 plus £30 per day to hire a car.
Mike's Motors charges £80 plus £25 per day to hire a car.

Jasmin wants to hire a car for 12 days.

Which company should she hire the car from?
You must show all your working.

.....

(Total for Question 9 is 3 marks)

10 (a) Write the number 76 000 in standard form.

.....

(1)

(b) Write 3.18×10^{-4} as an ordinary number.

.....

(1)

(Total for Question 10 is 2 marks)

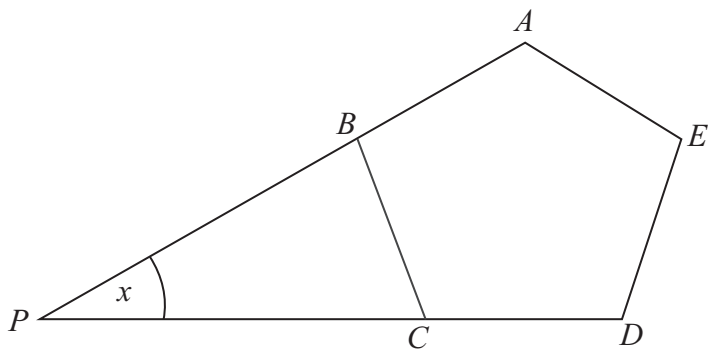
11 Factorise $x^2 + 6x - 40$

.....

(Total for Question 11 is 2 marks)

12

Diagram **NOT** accurately drawn



ABCDE is a regular pentagon.
PBA and *PCD* are straight lines.

Work out the size of the angle marked *x*.

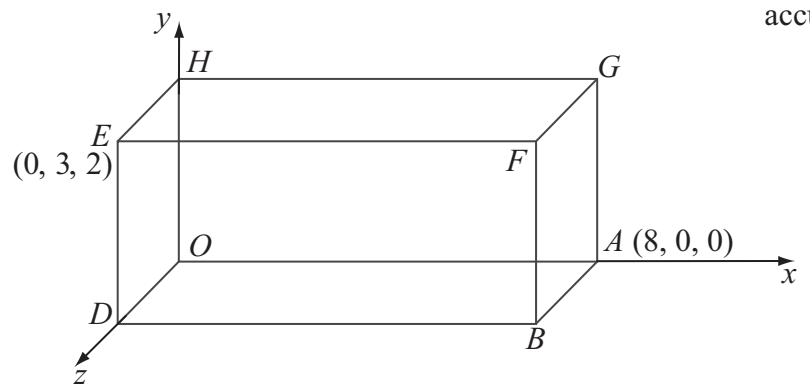
.....°

(Total for Question 12 is 3 marks)

W 3 9 4 9 2 A 0 9 1 2

13 The diagram shows a cuboid on a 3-D grid.

Diagram **NOT** accurately drawn



(a) Write down the coordinates of vertex F.

(..... , ... , ...)

(1)

(b) Work out the coordinates of the midpoint of the line segment AE.

(..... , ... , ...)

(2)

(Total for Question 13 is 3 marks)

14 (a) Write down the value of

(i) 5^0

.....

(ii) 2^{-3}

.....

.....

(2)

(b) Expand and simplify $(3 + \sqrt{2})^2$

Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.

.....

.....

(2)

(Total for Question 14 is 4 marks)

15 A straight line has equation $y = 5 - 2x$

(a) Write down an equation of a line parallel to $y = 5 - 2x$

.....

(1)

(b) Find an equation of the straight line that is perpendicular to the line $y = 5 - 2x$ and passes through the point (4, 1).

.....

(3)

(Total for Question 15 is 4 marks)

16 (a) Write $\frac{6}{x+3} - \frac{2}{x+1}$ as a single fraction in its simplest form.

.....

(3)

(b) Simplify fully $\frac{2x^2 - 9x - 5}{4x^2 - 1}$

.....

(3)

(Total for Question 16 is 6 marks)

W 3 9 4 9 2 A 0 1 1 1 2

***17**

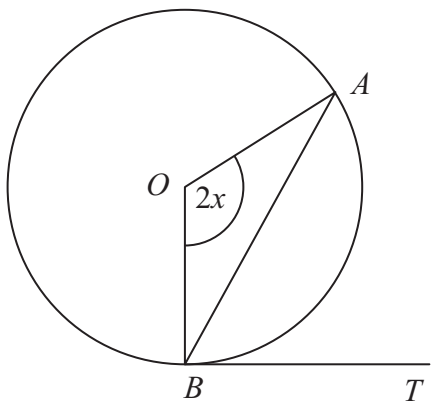


Diagram **NOT** accurately drawn

A and *B* are points on the circumference of a circle, centre *O*.
TB is a tangent to the circle.
Angle *BOA* = 2*x*.

Prove that angle *ABT* = *x*.
Give a reason for each stage in your working.

(Total for Question 17 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS

W 3 9 4 9 2 A 0 1 2 1 2